

SEQUENCE LISTING

(1) GENERAL INFORMATION:

(i) APPLICANT: Mitchell, William M.
Stratton, Charles W.

(ii) TITLE OF INVENTION: DIAGNOSIS AND MANAGEMENT OF
INFECTION CAUSED BY CHLAMYDIA

(iii) NUMBER OF SEQUENCES: 114

(iv) CORRESPONDENCE ADDRESS:

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(E) COUNTRY: USA
(F) ZIP: 02421-4799

(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Diskette
(B) COMPUTER: IBM Compatible
(C) OPERATING SYSTEM: Windows 95
(D) SOFTWARE: FastSEQ for Windows Version 2.0b

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER: 09/025,521
(B) FILING DATE: 18-FEB-1998
(C) CLASSIFICATION:

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: US 08/911,593
(B) FILING DATE: 14-AUG-1997

(A) APPLICATION NUMBER: US 60/023,921
(B) FILING DATE: 14-AUG-1996

(viii) ATTORNEY/AGENT INFORMATION:

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(C) REFERENCE/DOCKET NUMBER: VDB96-02pA2

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09709201-110300

(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

ATGAAAAAAC TCTTAAAGTC GCGTTATTA TCCGCCGCAT TTGCTGGTTC 50

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

ATGAAAAAAC TCTTAAAGTC GCGTTATTA TCCGCCGCAT TTGCTGGTTC 50

(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

ATGAAAAAAC TCTTGAAGTC GGCATTATTG TTGCCCCTA CGGGTTCCGC 50

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

ATGAAAAAAC TCTTAAAGTC GCGTTATTA TCCGCCGCAT TTGCTGGTTC 50

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(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

ATGAAAAAAC TCTTGAAATC GGCATTATTG TTTGCCGCTA CGGGTTCCGC

50

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

ATGAAAAAAC TCTTGAAATC GGCATTATTG TTTGCCGCTA CGGGTTCCGC

50

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

ATGAAAAAAC TCTTGAAATC GGCATTATTG TTTGCCGCTA CGGGTTCCGC

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(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

ATGAAAAAAC TCTTGAAATC GGCATTATTA TTTGCCGCTA CGGGTTCCGC

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09709201-110800

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

ATGAAAAAAC TCTTAAAATC GGCATTATTA TTTGCCGCTG CGGGTTCCGC

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(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

ATGAAAAAAC TCTTGAAATC GGTATTAGTA TTTGCCGCTT TGAGTTCTGC

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(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

ATGAAAAAAC TCTTGAAATC GGTATTAGTA TTTGCCGCTT TGAGTTCTGC

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(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

ATGAAAAAAC TCTTGAAATC GGTATTAGTA TTTGCCGCTT TGAGTTCTGC

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(2) INFORMATION FOR SEQ ID NO:13:

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(A) LENGTH: 50 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

ATGAAAAAAC TCTTGAAATC GGTATTAGTA TTTGCCGCTT TGAGTTCTGC

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(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 50 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

ATGAAAAAAC TCTTGAAATC GGTATTAGTA TTTGCCGCTT TGAGTTCTGC

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(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 50 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

ATGAAAAAAC TCTTGAAATC GGTATTAGTA TTTGCCGCTT TGAGTTCTGC

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(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 50 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

ATGAAAAAAC TCTTGAAATC GGTATTAGTG TTTGCCGCTT TGAGTTCTGC

50

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

ATGAAAAAAC TCTTGAAATC GGTATTAGTG TTTGCCGCTT TGAGTTCTGC

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(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

ATGAAAAAAC TCTTGAAATC GGTATTAGTG TTTGCCGCTT TGAGTTCTGC

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(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

ATGAAAAAAC TCTTGAAATC GGTATTAGCA TTTGCCGTTT TGGGTTCTGC

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(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

GTTTAATTAA CGAGAGAGCT GCTCACGTAT CTGGTCAGTT CAGATTCTAA

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(2) INFORMATION FOR SEQ ID NO:25:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

AACGTTAATC GACGCTGACA AATGGTCAAT CACTGGTGAA GCACGCTTAA

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(2) INFORMATION FOR SEQ ID NO:26:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

GCTTAATCAA TGAAAGAGCC GCTCACATGA ATGCTCAATT CAGATTCTAA

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(2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

GCTTAATCAA TGAAAGAGCT GCTCACATGA ATGCTCAATT CAGATTCTAA

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(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

GCTTAATCGA CGAAAGAGCT GCTCACATTA ATGCTCAATT CAGATTCTAA

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9/43

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

CGCAGTTACA GTTGAGACTC GCTTGATCGA TGAGAGAGCA GCTCACGTAA

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(2) INFORMATION FOR SEQ ID NO:30:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

GCTTGATCGA TGAGAGAGCA GGTCACGTAA ATGCACAATT CCGGTTCTAA

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(2) INFORMATION FOR SEQ ID NO:31:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

GCTTGATCGA TGAGAGAGCA GCTCACGTAA ATGCACAATT CCGCTTCTAA

50

(2) INFORMATION FOR SEQ ID NO:32:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

CGCTTGATCG ATGAGAGACT GCTCACGTAA ATGCACAATT CCGCTTCTAA

50

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(2) INFORMATION FOR SEQ ID NO:33:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

GCTTGATCGA TGAGAGAGCT GCTCACGTAA ATGCACAATT CCGCTTCTAA

50

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

GCTTGATCGA TGAGAGAGCA GCTCACGTAA ATGCACAATT CCGCTTCTAA

50

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

GCTTGATCGA TGAGAGAGCT GCTCACGTAA ATGCACAATT CCGCTTCTAA

50

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 49 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

CTTGATCGAT GAGAGAGCTG CTCACGTAAA TGCACAATTC CGCTTCTAA

49

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(2) INFORMATION FOR SEQ ID NO:37:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

GCTTGATCGA TGAGAGAGCA GCTCACGTAA ATGCACAATT CCGCTTCTAA

50

(2) INFORMATION FOR SEQ ID NO:38:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

GCTTGATCGA TGAAAGAGCA GCTCACGTAA ATGCTCAGTT CCGTTTCTAA

50

(2) INFORMATION FOR SEQ ID NO:39:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

CAGATACGTG AGCAGCTCTC TC

22

(2) INFORMATION FOR SEQ ID NO:40:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 25 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

CTCTTAAAGT CGGCGTTATT ATCCG

25

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(2) INFORMATION FOR SEQ ID NO:41:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 38 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

ATGAAAAAAC TCTTAAAGTC GCGGTTATTA TCCGCCGC

38

(2) INFORMATION FOR SEQ ID NO:42:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 40 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

TTAGAATCTG AACTGACCAG ATACGTGAGC AGCTCTCTCG

40

(2) INFORMATION FOR SEQ ID NO:43:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 45 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

AGCTTACCAT GGCTAAAAAA CTCTTAAAGT CGGCGTTATT ATCCG

45

(2) INFORMATION FOR SEQ ID NO:44:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 39 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

ATATGCGGCC GTCATAGAA TCTGAACTGA CCAGATACG

39

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(2) INFORMATION FOR SEQ ID NO:45:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15
 Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30
 Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45
 Asp Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Met Arg Met Gly Tyr
 50 55 60
 Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Gln Thr Asp Val Asn Lys
 65 70 75 80
 Glu Phe Gln Met Gly Ala Lys Pro Thr Thr Ala Thr Gly Asn Ala Ala
 85 90 95
 Ala Pro Ser Thr
 100

(2) INFORMATION FOR SEQ ID NO:46:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15
 Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30
 Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45
 Asp Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Met Ile Met Gly Tyr
 50 55 60
 Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Lys Thr Asp Val Asn Lys
 65 70 75 80
 Glu Phe Gln Met Gly Ala Lys Pro Thr Thr Thr Thr Gly Asn Ala Ala
 85 90 95
 Ala Pro Ser Thr
 100

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(2) INFORMATION FOR SEQ ID NO:47:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15
 Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30
 Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45
 Asp Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Met Arg Met Gly Tyr
 50 55 60
 Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Glu Thr Asp Val Asn Lys
 65 70 75 80
 Glu Phe His Met Gly Ala Lys Pro Thr Thr Asp Thr Gly Asn Ser Ala
 85 90 95
 Ala Pro Leu Thr
 100

(2) INFORMATION FOR SEQ ID NO:48:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15
 Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30
 Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45
 Asp Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Met Ile Met Gly Tyr
 50 55 60
 Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Lys Thr Asp Val Asn Lys
 65 70 75 80
 Glu Phe His Met Gly Asp Lys Pro Thr Ser Thr Thr Gly Asn Ala Thr
 85 90 95
 Ala Pro Thr Thr
 100

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

[illegible]

(2) INFORMATION FOR SEQ ID NO:53:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 97 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15
 Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30
 Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45
 Ala Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Met Val Met Gly Tyr
 50 55 60
 Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Lys Thr Asp Val Asn Lys
 65 70 75 80
 Glu Phe Gln Met Gly Ala Ala Pro Thr Thr Asn Asp Ala Ala Pro Lys
 85 90 95
 Thr

(2) INFORMATION FOR SEQ ID NO:54:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 102 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15
 Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30
 Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45
 Asp Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Met Val Met Gly Tyr
 50 55 60
 Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Lys Thr Asp Val Asn Lys
 65 70 75 80
 Glu Phe Gln Met Gly Ala Glu Pro Thr Thr Ser Asp Thr Ala Gly Leu
 85 90 95
 Ser Asn Asp Pro Thr Thr
 100

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19/43

(2) INFORMATION FOR SEQ ID NO:57:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

Cys Thr Ala Arg Glu Asn Pro Ala Tyr Gly Arg His Met Gln Asp Ala
1 5 10 15
Glu Met Phe Thr Asn Ala Ala Tyr Met Ala Leu Ile Asn Trp Asp Arg
20 25 30
Phe Asp Val Phe Cys Thr Leu Gly Ala Thr Ser Gly Tyr Leu Lys Gly
35 40 45
Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe Gly Asp Asn Glu Asn
50 55 60
His Ala Thr Val Ser Asp Ser Lys Leu Val Pro Asn Met Ser Leu Asp
65 70 75 80
Gln Ser Val Val Glu Leu Tyr Thr Asp Thr Thr Phe Ala Trp Ser Ala
85 90 95
Gly Ala Arg Ala
100

(2) INFORMATION FOR SEQ ID NO:58:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 65 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

Leu Thr Ala Arg Glu Asn Pro Ala Tyr Gly Arg His Met Gln Asp Ala
1 5 10 15
Glu Met Phe Thr Asn Cys Ala Tyr Met Ala Leu Ile Asn Trp Asp Arg
20 25 30
Phe Asp Val Phe Cys Thr Leu Gly Ala Ser Ser Gly Tyr Leu Lys Gly
35 40 45
Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe Gly Asn Asn Glu Asn
50 55 60
Gln
65

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(2) INFORMATION FOR SEQ ID NO:59:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 134 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

Cys Thr Ala Arg Glu Asn Pro Ala Tyr Gly Arg His Met Gln Asp Ala
 1 5 10 15
 Glu Met Phe Thr Asn Cys Ala Tyr Met Ala Leu Ile Asn Trp Asp Arg
 20 25 30
 Phe Asp Val Phe Cys Thr Leu Gly Ala Thr Ser Gly Tyr Leu Lys Gly
 35 40 45
 Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe Gly Asp Asn Glu Asn
 50 55 60
 Gln Lys Thr Val Lys Ala Glu Ser Val Pro Asn Met Ser Phe Asp Gln
 65 70 75 80
 Ser Val Val Glu Leu Tyr Thr Asp Thr Thr Phe Ala Trp Ser Val Gly
 85 90 95
 Ala Arg Ala Thr Lys Val Ser Asn Gly Thr Phe Val Pro Asn Met Ser
 100 105 110
 Leu Asp Gln Ser Val Val Glu Leu Tyr Thr Asp Thr Ala Phe Ala Trp
 115 120 125
 Ser Val Gly Ala Arg Ala
 130

(2) INFORMATION FOR SEQ ID NO:60:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 99 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

Leu Thr Ala Arg Glu Asn Pro Ala Tyr Gly Arg His Met Gln Asp Ala
 1 5 10 15
 Glu Met Phe Thr Asn Cys Ala Tyr Met Ala Leu Ile Asn Trp Asp Arg
 20 25 30
 Phe Asp Val Phe Cys Thr Leu Gly Ala Ser Ser Gly Tyr Leu Lys Gly
 35 40 45
 Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe Gly Asp Asn Glu Asn
 50 55 60

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Gln Ser Thr Val Lys Thr Asn Ser Val Pro Asn Met Ser Leu Asp Gln
 65 70 75 80
 Ser Val Val Glu Leu Tyr Thr Asp Thr Ala Phe Ser Trp Ser Val Gly
 85 90 95
 Ala Arg Ala

(2) INFORMATION FOR SEQ ID NO:61:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 99 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

Cys Thr Ala Arg Glu Asn Pro Ala Tyr Gly Arg His Met Gln Asp Ala
 1 5 10 15
 Glu Met Phe Thr Asn Ala Ala Tyr Met Ala Leu Ile Asn Trp Asp Arg
 20 25 30
 Phe Asp Val Phe Cys Thr Leu Gly Ala Thr Ser Gly Tyr Leu Lys Gly
 35 40 45
 Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe Gly Asp Asn Glu Asn
 50 55 60
 Gln Ser Thr Val Lys Lys Asp Ala Val Pro Asn Met Ser Phe Asp Gln
 65 70 75 80
 Ser Val Val Glu Leu Tyr Thr Asp Thr Thr Phe Ala Trp Ser Val Gly
 85 90 95
 Ala Arg Ala

(2) INFORMATION FOR SEQ ID NO:62:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 99 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

Leu Val Glu Arg Thr Asn Pro Ala Tyr Gly Lys His Met Gln Asp Ala
 1 5 10 15
 Glu Met Phe Thr Asn Cys Ala Tyr Thr Ala Leu Ile Asn Trp Asp Arg
 20 25 30
 Phe Asp Val Phe Cys Thr Leu Gly Ala Thr Ser Gly Tyr Leu Lys Gly
 35 40 45
 Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe Gly Asp Gly Val Asn
 50 55 60

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Ala Thr Lys Pro Ala Ala Asp Ser Ile Pro Asn Val Gln Leu Asn Gln
65 70 75 80
Ser Val Val Glu Leu Tyr Thr Asp Thr Thr Phe Ala Trp Ser Val Gly
85 90 95
Ala Arg Ala

(2) INFORMATION FOR SEQ ID NO:63:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

[illegible]

(2) INFORMATION FOR SEQ ID NO:64:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:64:

Asn	Val	Ala	Arg	Pro	Asn	Pro	Ala	Tyr	Gly	Lys	His	Met	Gln	Asp	Ala
1				5					10					15	
Glu	Met	Phe	Thr	Asn	Ala	Ala	Tyr	Met	Ala	Leu	Ile	Asn	Trp	Asp	Arg
			20					25					30		
Phe	Asp	Val	Phe	Cys	Thr	Leu	Gly	Ala	Thr	Thr	Gly	Tyr	Leu	Lys	Gly
		35					40					45			
Asn	Ser	Ala	Ser	Phe	Asn	Leu	Val	Gly	Leu	Phe	Gly	Thr	Lys	Thr	Gln
	50					55					60				

Ser Ser Gly Phe Asp Thr Ala Asn Ile Val Pro Asn Thr Ala Leu Asn
 65 70 75 80
 Gln Ala Val Val Glu Leu Tyr Thr Asp Thr Thr Phe Ala Trp Ser Val
 85 90 95
 Gly Ala Arg Ala
 100

(2) INFORMATION FOR SEQ ID NO:65:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:65:

Asn Val Ala Arg Pro Asn Pro Ala Tyr Gly Lys His Met Gln Asp Ala
 1 5 10 15
 Glu Met Phe Thr Asn Ala Ala Tyr Met Ala Leu Ile Asn Trp Asp Arg
 20 25 30
 Phe Asp Val Phe Cys Thr Leu Gly Ala Thr Thr Gly Tyr Leu Lys Gly
 35 40 45
 Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe Gly Thr Lys Thr Lys
 50 55 60
 Ser Ser Asp Phe Asn Thr Ala Lys Leu Val Pro Asn Ile Ala Leu Asn
 65 70 75 80
 Arg Ala Val Val Glu Leu Tyr Thr Asp Thr Thr Phe Ala Trp Ser Val
 85 90 95
 Gly Ala Arg Ala
 100

(2) INFORMATION FOR SEQ ID NO:66:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:66:

Asn Val Ala Arg Pro Asn Pro Ala Tyr Gly Lys His Met Gln Asp Ala
 1 5 10 15
 Glu Met Phe Thr Asn Ala Ala Tyr Met Ala Leu Ile Asn Trp Asp Arg
 20 25 30
 Phe Asp Val Phe Cys Thr Leu Gly Ala Thr Thr Gly Tyr Leu Lys Gly
 35 40 45
 Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe Gly Thr Lys Thr Gln
 50 55 60

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[illegible]

(2) INFORMATION FOR SEQ ID NO:67:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 96 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:67:

Ala	Ser	Arg	Glu	Asn	Pro	Ala	Tyr	Gly	Lys	His	Met	Gln	Asp	Ala	Glu
1				5					10					15	
Met	Phe	Thr	Asn	Ala	Ala	Tyr	Met	Ala	Leu	Ile	Asn	Trp	Asp	Arg	Phe
			20					25					30		
Asp	Val	Phe	Cys	Thr	Leu	Gly	Ala	Thr	Ser	Gly	Tyr	Leu	Lys	Gly	Asn
		35				40						45			
Ser	Ala	Ala	Phe	Asn	Leu	Val	Gly	Leu	Phe	Gly	Arg	Asp	Glu	Thr	Ala
	50					55				60					
Val	Ala	Ala	Asp	Asp	Ile	Pro	Asn	Val	Ser	Leu	Ser	Gln	Ala	Val	Val
65					70					75				80	
Glu	Leu	Tyr	Thr	Asp	Thr	Ala	Phe	Ala	Trp	Ser	Val	Gly	Ala	Arg	Ala
				85					90				95		

(2) INFORMATION FOR SEQ ID NO:68:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:68:

Tyr	Thr	Thr	Ala	Val	Asp	Arg	Pro	Asn	Pro	Ala	Tyr	Asn	Lys	His	Leu
1				5					10					15	
His	Asp	Ala	Glu	Trp	Phe	Thr	Asn	Ala	Gly	Ile	Phe	Ala	Leu	Ile	Asn
			20					25					30		
Trp	Asp	Arg	Phe	Asp	Val	Phe	Cys	Thr	Leu	Gly	Ala	Ser	Asn	Gly	Ile
			35				40						45		
Arg	Lys	Gly	Asn	Ser	Thr	Ala	Phe	Asn	Leu	Val	Gly	Leu	Phe	Gly	Val
			50			55					60				
Lys	Gly	Thr	Thr	Val	Asn	Ala	Asn	Glu	Leu	Pro	Asn	Val	Ser	Leu	Ser
65					70					75					80

Asn Gly Val Val Glu Leu Tyr Thr Asp Thr Ser Phe Ser Trp Ser Val
 85 90 95
 Gly Ala Arg Ala
 100

(2) INFORMATION FOR SEQ ID NO:69:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:69:

Ala Leu Trp Glu Cys Gly Cys Ala Thr Leu Gly Ala Ser Phe Gln Tyr
 1 5 10 15
 Ala Gln Ser Lys Pro Lys Val Glu Glu Leu Asn Val Leu Cys Asn Ala
 20 25 30
 Ala Glu Phe Thr Ile Asn Lys Pro Lys Gly Tyr Val Gly Gln Glu Phe
 35 40 45
 Pro Leu Asp Leu Lys Ala Gly Thr Asp Gly Val Thr Gly Thr Lys Asp
 50 55 60
 Ala Ser Ile Asp Tyr His Glu Trp Gln Ala Ser Leu Ala Leu Ser Tyr
 65 70 75 80
 Arg Leu Asn Met Phe Thr Pro Tyr Ile Gly Val Lys Trp Ser Arg Ala
 85 90 95
 Ser Phe Asp Ala
 100

(2) INFORMATION FOR SEQ ID NO:70:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:70:

Ala Leu Trp Glu Cys Gly Cys Ala Thr Leu Gly Ala Ser Phe Gln Tyr
 1 5 10 15
 Ala Gln Ser Lys Pro Lys Val Glu Glu Leu Asn Val Leu Cys Asn Ala
 20 25 30
 Ala Glu Phe Thr Ile Asn Lys Pro Lys Gly Tyr Val Gly Lys Glu Leu
 35 40 45
 Pro Leu Asp Leu Thr Ala Gly Thr Asp Ala Ala Thr Gly Thr Lys Asp
 50 55 60
 Ala Ser Ile Asp Tyr His Glu Trp Gln Ala Ser Leu Ala Leu Ser Tyr
 65 70 75 80

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Arg Leu Asn Met Phe Thr Pro Tyr Ile Gly Val Lys Trp Ser Arg Ala
85 90 95
Ser Phe Asp Ala
100

(2) INFORMATION FOR SEQ ID NO:71:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEO ID NO:71:

[illegible]

(2) INFORMATION FOR SEQ ID NO:72:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:72:

Ala	Leu	Trp	Glu	Cys	Gly	Cys	Ala	Thr	Leu	Gly	Ala	Ser	Phe	Gln	Tyr
1				5					10					15	
Ala	Gln	Ser	Lys	Pro	Lys	Val	Glu	Glu	Leu	Asn	Val	Leu	Cys	Asn	Ala
			20					25					30		
Ala	Glu	Phe	Thr	Ile	Asn	Lys	Pro	Lys	Gly	Tyr	Val	Gly	Gln	Glu	Phe
		35					40					45			
Pro	Leu	Ala	Leu	Ile	Ala	Gly	Thr	Asp	Ala	Ala	Thr	Gly	Thr	Lys	Asp
	50					55					60				
Ala	Ser	Ile	Asp	Tyr	His	Glu	Trp	Gln	Ala	Ser	Leu	Ala	Leu	Ser	Tyr
65					70					75					80

Arg Leu Asn Met Phe Thr Pro Tyr Ile Gly Val Lys Trp Ser Arg Ala
85 90 95
Ser Phe Asp Ala
100

(2) INFORMATION FOR SEO ID NO:73:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:73:

[illegible]

(2) INFORMATION FOR SEO ID NO:74:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:74:

Ala	Leu	Trp	Glu	Cys	Gly	Cys	Ala	Thr	Leu	Gly	Ala	Ser	Phe	Gln	Tyr
1				5					10					15	
Ala	Gln	Ser	Lys	Pro	Lys	Ile	Glu	Glu	Leu	Asn	Val	Leu	Cys	Asn	Ala
			20					25					30		
Ala	Glu	Phe	Thr	Ile	Asn	Lys	Pro	Lys	Gly	Tyr	Val	Gly	Lys	Glu	Phe
		35					40					45			
Pro	Leu	Asp	Leu	Thr	Ala	Gly	Thr	Asp	Ala	Ala	Thr	Gly	Thr	Lys	Asp
	50					55					60				
Ala	Ser	Ile	Asp	Tyr	His	Glu	Trp	Gln	Ala	Ser	Leu	Ser	Leu	Ser	Tyr
65					70					75					80

Arg Leu Asn Met Phe Thr Pro Tyr Ile Gly Val Lys Trp Ser Arg Ala
85 90 95
Ser Phe Asp Ser
100

(2) INFORMATION FOR SEQ ID NO:75:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:75:

[illegible]

(2) INFORMATION FOR SEQ ID NO:76:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:76:

Ala	Leu	Trp	Glu	Cys	Gly	Cys	Ala	Thr	Leu	Gly	Ala	Ser	Phe	Gln	Tyr
1				5					10					15	
Ala	Gln	Ser	Lys	Pro	Lys	Val	Glu	Glu	Leu	Asn	Val	Leu	Cys	Asn	Ala
			20					25					30		
Ser	Glu	Phe	Thr	Ile	Asn	Lys	Pro	Lys	Gly	Tyr	Val	Gly	Ala	Glu	Phe
		35					40					45			
Pro	Leu	Asp	Ile	Thr	Ala	Gly	Thr	Glu	Ala	Ala	Thr	Gly	Thr	Lys	Asp
	50					55					60				

29/43

Ala Ser Ile Asp Tyr His Glu Trp Gln Ala Ser Leu Ala Leu Ser Tyr
65 70 75 80
Arg Leu Asn Met Phe Thr Pro Tyr Ile Gly Val Lys Trp Ser Arg Val
85 90 95
Ser Phe Asp Ala
100

(2) INFORMATION FOR SEQ ID NO:77:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:77:

Ala Leu Trp Glu Cys Gly Cys Ala Thr Leu Gly Ala Ser Phe Gln Tyr
1 5 10 15
Ala Gln Ser Lys Pro Lys Val Glu Glu Leu Asn Val Leu Cys Asn Ala
20 25 30
Ser Glu Phe Thr Ile Asn Lys Pro Lys Gly Tyr Val Gly Ala Glu Phe
35 40 45
Pro Leu Asp Ile Thr Ala Gly Thr Glu Ala Ala Thr Gly Thr Lys Asp
50 55 60
Ala Ser Ile Asp Tyr His Glu Trp Gln Ala Ser Leu Ala Leu Ser Tyr
65 70 75 80
Arg Leu Asn Met Phe Thr Pro Tyr Ile Gly Val Lys Trp Ser Arg Val
85 90 95
Ser Phe Asp Ala
100

(2) INFORMATION FOR SEQ ID NO:78:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:78:

Ala Leu Trp Glu Cys Gly Cys Ala Thr Leu Gly Ala Ser Phe Gln Tyr
1 5 10 15
Ala Gln Ser Lys Pro Lys Val Glu Glu Leu Asn Val Leu Cys Asp Ala
20 25 30
Ser Glu Phe Thr Ile Asn Lys Pro Lys Gly Tyr Val Gly Ala Glu Phe
35 40 45
Pro Leu Asp Ile Thr Ala Gly Thr Glu Ala Ala Thr Gly Thr Lys Asp
50 55 60

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Ala Ser Ile Asp Tyr His Glu Trp Gln Ala Ser Leu Ala Leu Ser Tyr
 65 70 75 80
 Arg Leu Asn Met Phe Thr Pro Tyr Ile Gly Val Lys Trp Ser Arg Val
 85 90 95
 Ser Phe Asp Ala
 100

(2) INFORMATION FOR SEQ ID NO:79:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:79:

Ala Leu Trp Glu Cys Gly Cys Ala Thr Leu Gly Ala Ser Phe Gln Tyr
 1 5 10 15
 Ala Gln Ser Lys Pro Lys Val Glu Glu Leu Asn Val Leu Cys Asn Ala
 20 25 30
 Ala Glu Phe Thr Ile Asn Lys Pro Lys Gly Tyr Val Gly Gln Glu Phe
 35 40 45
 Pro Leu Asn Ile Lys Ala Gly Thr Val Ser Ala Thr Asp Thr Lys Asp
 50 55 60
 Ala Ser Ile Asp Tyr His Glu Trp Gln Ala Ser Leu Ala Leu Ser Tyr
 65 70 75 80
 Arg Leu Asn Met Phe Thr Pro Tyr Ile Gly Val Lys Trp Ser Arg Ala
 85 90 95
 Ser Phe Asp Ala
 100

(2) INFORMATION FOR SEQ ID NO:80:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:80:

Gly Leu Trp Glu Cys Gly Cys Ala Thr Leu Gly Glu Ser Phe Gln Tyr
 1 5 10 15
 Ala Gln Ser Lys Pro Lys Val Glu Glu Leu Asn Val Ile Cys Asn Val
 20 25 30
 Ser Gln Phe Ser Val Asn Lys Pro Lys Gly Tyr Lys Gly Val Ala Phe
 35 40 45
 Pro Leu Pro Thr Asp Ala Gly Val Ala Thr Ala Thr Gly Thr Lys Ser
 50 55 60

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Val Asp Ala Asp Lys Tyr Ala Ile Thr Val Glu Thr Arg Leu Ile Asp
65 70 75 80
Glu Arg Ala Ala His Val Asn Ala Gln Phe Arg Phe
85 90

(2) INFORMATION FOR SEQ ID NO:83:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 94 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:83:

Asp 1	Thr	Ile	Arg	Ile 5	Ala	Gln	Pro	Lys	Ser 10	Ala	Thr	Ala	Ile	Phe 15	Asp
Thr	Thr	Thr	Leu 20	Asn	Pro	Thr	Ile	Ala 25	Gly	Ala	Gly	Asp	Val 30	Lys	Thr
Gly	Thr	Glu	Gly 35	Gln	Leu	Gly	Asp 40	Thr	Met	Gln	Ile	Val 45	Ser	Leu	Gln
Leu	Asn 50	Lys	Met	Lys	Ser	Arg 55	Lys	Ser	Cys	Gly	Ile 60	Ala	Val	Gly	Thr
Thr 65	Ile	Val	Asp	Ala 70	Asp	Lys	Tyr	Ala	Val 75	Thr	Val	Glu	Thr	Arg	Leu 80
Ile	Asp	Glu	Arg	Ala 85	Ala	His	Val	Asn 90	Ala	Gln	Phe	Arg	Phe		

(2) INFORMATION FOR SEQ ID NO:84:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 94 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:84:

Asp 1	Thr	Ile	Arg	Ile 5	Ala	Gln	Pro	Lys	Ser 10	Ala	Thr	Ala	Ile	Phe 15	Asp
Thr	Thr	Thr	Leu 20	Asn	Pro	Thr	Ile	Ala 25	Gly	Ala	Gly	Asp 30	Val	Lys	Ala
Ser	Ala	Glu	Gly	Gln	Leu	Gly	Asp 40	Thr	Met	Gln	Ile	Val 45	Ser	Leu	Gln
Leu	Asn	Lys	Met	Lys	Ser	Arg 55	Lys	Ser	Cys	Gly	Ile 60	Ala	Val	Gly	Thr
Thr 65	Ile	Val	Asp	Ala	Asp 70	Lys	Tyr	Ala	Val 75	Thr	Val	Glu	Thr	Arg	Leu 80
Ile	Asp	Glu	Arg	Ala 85	Ala	His	Val	Asn 90	Ala	Gln	Phe	Arg	Phe		

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:85:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:86:

Asp 1	Thr	Ile	Arg	Ile 5	Ala	Gln	Pro	Arg	Leu 10	Val	Thr	Pro	Val	Val 15	Asp
Ile	Thr	Thr	Leu	Asn 20	Pro	Thr	Ile	Ala 25	Gly	Ala	Cys	Asp	Ser 30	Lys	Ala
Gly	Asn	Thr	Glu	Gly 35	Gln	Ile	Ser 40	Asp	Thr	Met	Gln	Ile 45	Val	Ser	Leu
Gln	Leu	Asn	Lys	Met 50	Lys	Ser 55	Arg	Lys	Ser	Cys	Gly 60	Ile	Ala	Val	Gly
Thr 65	Thr	Ile	Val	Asp 70	Ala	Asp	Lys	Tyr	Ala 75	Val	Thr	Val	Glu	Thr 80	Arg
Leu	Ile	Asp	Glu	Arg 85	Ala	Ala	His	Val 90	Asn	Ala	Gln	Phe	Arg 95	Phe	

(2) INFORMATION FOR SEQ ID NO:87:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 95 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:87:

```

Asp Thr Ile Arg Ile Ala Gln Pro Lys Leu Ala Glu Ala Ile Leu Asp
 1           5           10           15
Val Thr Thr Leu Asn Arg Thr Thr Ala Gly Lys Gly Ser Val Val Ser
          20           25           30
Ala Gly Thr Asp Asn Glu Leu Ala Asp Thr Met Gln Ile Val Ser Leu
          35           40           45
Gln Leu Asn Lys Met Lys Ser Arg Lys Ser Cys Gly Ile Ala Val Gly
          50           55           60
Thr Thr Ile Val Asp Ala Asp Lys Tyr Ala Val Thr Val Glu Ala Arg
65           70           75           80
Leu Ile Asp Glu Arg Ala Ala His Val Asn Ala Gln Phe Arg Phe
          85           90           95

```

(2) INFORMATION FOR SEQ ID NO:88:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 94 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:88:

```

Asp Thr Ile Arg Ile Ala Gln Pro Lys Leu Ala Lys Pro Val Leu Asp
 1           5           10           15
Thr Thr Thr Leu Asn Pro Thr Ile Ala Gly Lys Gly Thr Val Val Ser
          20           25           30
Ser Ala Glu Asn Glu Leu Ala Asp Thr Met Gln Ile Val Ser Leu Gln
          35           40           45
Leu Asn Lys Met Lys Ser Arg Lys Ser Cys Gly Ile Ala Val Gly Thr
          50           55           60
Thr Ile Val Asp Ala Asp Lys Tyr Ala Val Thr Val Glu Thr Arg Leu
65           70           75           80
Ile Asp Glu Arg Ala Ala His Val Asn Ala Gln Phe Arg Phe
          85           90

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008077-110800

(2) INFORMATION FOR SEQ ID NO:89:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 94 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:89:

```

Asp Thr Ile Arg Ile Ala Gln Pro Lys Leu Ala Glu Ala Ile Leu Asp
 1           5           10           15
Val Thr Thr Leu Asn Pro Thr Ile Ala Gly Lys Gly Thr Val Val Ala
      20           25           30
Ser Gly Ser Asp Asn Asp Leu Ala Asp Thr Met Gln Ile Val Ser Leu
      35           40           45
Gln Leu Asn Lys Met Lys Ser Arg Lys Ser Cys Gly Ile Ala Val Gly
      50           55           60
Thr Thr Ile Val Asp Ala Asp Lys Tyr Ala Val Thr Val Glu Thr Arg
      65           70           75           80
Leu Ile Asp Glu Arg Ala Ala His Val Asn Ala Gln Phe Arg
              85           90

```

(2) INFORMATION FOR SEQ ID NO:90:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 95 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:90:

```

Asp Thr Ile Arg Ile Ala Gln Pro Lys Leu Ala Glu Ala Val Leu Asp
 1           5           10           15
Val Thr Thr Leu Asn Pro Thr Ile Ala Gly Lys Gly Ser Val Val Ala
      20           25           30
Ser Gly Ser Glu Asn Glu Leu Ala Asp Thr Met Gln Ile Val Ser Leu
      35           40           45
Gln Leu Asn Lys Met Lys Ser Arg Lys Ser Cys Gly Ile Ala Val Gly
      50           55           60
Thr Thr Ile Val Asp Ala Asp Lys Tyr Ala Val Thr Val Glu Thr Arg
      65           70           75           80
Leu Ile Asp Glu Arg Ala Ala His Val Asn Ala Gln Phe Arg Phe
              85           90           95

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003011-10300

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:91:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:92:

Asp 1	Asn	Ile	Arg	Ile 5	Ala	Gln	Pro	Lys	Leu 10	Pro	Thr	Ala	Val	Leu 15	Asn
Leu	Thr	Ala	Trp 20	Asn	Pro	Ser	Leu	Leu 25	Gly	Asn	Ala	Thr	Ala 30	Leu	Ser
Thr	Thr	Asp 35	Ser	Phe	Ser	Asp 40	Phe	Met	Gln	Ile	Val 45	Ser	Cys	Gln	Ile
Asn	Lys 50	Phe	Lys	Ser	Arg	Lys 55	Ala	Cys	Val	Thr 60	Ala	Val	Ala	Thr	Leu
Ile 65	Val	Asp	Ala	Asp 70	Lys	Trp	Ser	Leu	Thr 75	Ala	Glu	Ala	Arg	Leu 80	Asn
Asp	Glu	Arg	Ala	Ala 85	His	Ser	Gly	Ala 90	Gln	Phe	Arg	Phe			

(2) INFORMATION FOR SEQ ID NO:93:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:93:

Cys Thr Gly Ser Ala Ala Asn Tyr Thr Thr Ala Val Asp Arg Pro
 1 5 10 15
 Asn

(2) INFORMATION FOR SEQ ID NO:94:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:94:

Cys Thr Gly Asp Ala Asp Leu Thr Thr Ala Pro Thr Pro Ala Ser Arg
 1 5 10 15
 Glu Asn

(2) INFORMATION FOR SEQ ID NO:95:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:95:

Cys Thr Thr Ala Thr Gly Asn Ala Ala Ala Pro Ser Thr Cys Thr Ala
 1 5 10 15
 Arg Glu Asn

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(2) INFORMATION FOR SEQ ID NO:96:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:96:

Cys Ala Ser Gly Thr Ala Ser Asn Thr Thr Val Ala Ala Asp Arg Ser
 1 5 10 15
 Asn

(2) INFORMATION FOR SEQ ID NO:97:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:97:

Cys Phe Gly Val Lys Gly Thr Thr Val Asn Ala Asn Glu Leu Pro
 1 5 10 15

(2) INFORMATION FOR SEQ ID NO:98:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:98:

Cys Phe Gly Arg Asp Glu Thr Ala Val Ala Ala Asp Asp Ile Pro
 1 5 10 15

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(2) INFORMATION FOR SEQ ID NO:102:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:102:

Cys Gln Ile Asn Lys Met Lys Ser Arg Phe Ala Cys Gly
 1 5 10

(2) INFORMATION FOR SEQ ID NO:103:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:103:

Cys Gln Leu Asn Lys Met Lys Ser Arg Lys Ala Cys Gly
 1 5 10

(2) INFORMATION FOR SEQ ID NO:104:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:104:

Cys Gln Ile Asn Lys Phe Lys Ser Arg Phe Ala Cys Gly
 1 5 10

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(2) INFORMATION FOR SEQ ID NO:105:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 38 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:105:

ATGAAAAAAC TCTTAAAGTC GCGTTATTA TCCGCCGC

38

(2) INFORMATION FOR SEQ ID NO:106:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 44 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:106:

ATGAAAAAAC TCTTGAAATC GGTATTAGTG TTTGCCGCTT TGAG

44

(2) INFORMATION FOR SEQ ID NO:107:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 44 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:107:

ATGAAAAAAC TCTTAAAATC GGCATTATTA TTTGCCGCTG CGGG

44

(2) INFORMATION FOR SEQ ID NO:108:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 44 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:108:

ATGAAAAAAC TCTTGAAATC GGCATTATTG TTTGCCGCTA CGGG

44

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(2) INFORMATION FOR SEQ ID NO:109:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:109:

ATGAAAAAAC TCTTGAAATC GGTATTAGCA TTTGCCGTTT TGGGTTCTGC

50

(2) INFORMATION FOR SEQ ID NO:110:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 40 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:110:

TTAGAATCTG AACTGACCAG ATACGTGAGC AGCTCTCTCG

40

(2) INFORMATION FOR SEQ ID NO:111:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 35 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:111:

TTAGAAGCGG AATTGTGCAT TTACGTGAGC AGCTC

35

(2) INFORMATION FOR SEQ ID NO:112:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 43 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:112:

TTAGAATCTG AATTGAGCAT TAATGTGAGC AGCTCTTTTCG TCG

43

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42

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